DEPARTMENT OF ENERGY

"MODEL" FIRE PROTECTION PROGRAM

FORWARD

This Fire Protection Program may be applied to all U.S. Department of Energy (DOE) sites and operations. This program demonstrates acceptable methods and examples to assist each DOE site in meeting the fire protection objectives provided in DOE Order 5480.7A, "Fire Protection." The program may be used in full or in part for establishing new programs or for improving existing ones, and the examples may be used verbatim or tailored for specific site needs.

DOE site fire protection programs are not expected to follow the exact format of this program, but are expected to address, as a minimum, the items included in the Table of Contents as they apply to the specific sites. Where specific site areas are not covered in this program, other site fire protection programs would be expected to address those items to the same level of detail, as a minimum, as provided in this program.

This program is not intended to prevent the use of other systems or methods, provided the alternate approaches address the items to an equivalent level as in this Program.

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U.S. DEPARTMENT OF ENERGY
"MODEL" FIRE PROTECTION PROGRAM

TABLE OF CONTENTS

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

ACRONYMS

AC	Alternating current
AFFF	Aqueous film-forming foam
AGA	American Gas Association
AHJ	Authority having jurisdiction
BED	Building Emergency Director
BLEVE	Boiling liquid expanding vapor explosion
CHEMTREC	Chemical Transportation Emergency Center
CO_2	Carbon dioxide
CPR	Cardiopulmonary resuscitation
CTC	Canadian Transportation Commission
DC	Direct current
DOE	U.S. Department of Energy
DOE-HQ	U.S. Department of Energy-Headquarters
DOT	U.S. Department of Transportation
EMT	Emergency medical technician
EPSS	Emergency power supply system
ERG	Emergency Response Guidebook
ESRF	Embankment-support rubberized fabric
FACP	Fire alarm control panel
FDC	Fire department connection
FM	Factory Mutual
HAZMAT	Hazardous material
HEPA	High-efficiency particulate air
HVAC	Heating, ventilation, and air conditioning
IFSTA	International Fire Service Training Association
MCFL	Maximum credible fire loss
MPFL	Maximum possible fire loss
MSDS	Material Safety Data Sheet
NFPA	National Fire Protection Association
OSHA	Occupational Safety and Health Administration
OS&Y	Outside screw and yoke
PA	Public address
PADI	Pocket alarm dosimeter instrument
PASS	Personal Alert Safety System
PCB	Polychlorinated biphenyls
PIV	Post indicator valve
PM	Preventive maintenance
SAR	Safety analysis report
SCBA	Self-contained breathing apparatus
SEPSS	Stored electrical energy emergency and standby power system
SFPE	Society of Fire Protection Engineers
SWP	Special work permit
T&S	Testing and Services
UL	Underwriters Laboratories

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1.0 SITE SPECIFIC FIRE PROTECTION OVERVIEW

1.1 SITE OVERVIEW

This section should include a brief overview of the site's operations and mission, and the fire protection program. It should include a short description of how the Fire Protection Engineering group operates, the emergency response services available to the site, the water supply to the site, who performs testing and maintenance activities for the fire protection systems, any major fire losses that have occurred in the past, and specifically, any fire protection systems or hazards that are considered unique to the site.

1.2 POLICY STATEMENT

This section should include a senior management policy statement regarding the goals of, and commitment to, the fire protection program. The statement should be dated and signed by senior management. {Reference DOE 5480.7A, Section 9.a.(1)(a) and (b)}

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2.0 MANAGEMENT AND ADMINISTRATION

2.1 MANAGEMENT RESPONSIBILITIES

This section should include management's responsibilities involving the site fire protection program and clearly define who is responsible for implementing the different parts of the program. Those with fire protection signature authority should also be identified. A statement concerning the need to resolve conflicts between these fire protection requirements and those of other disciplines should also be addressed. The following serves as an example: {Reference DOE 5480.7A, Section 9.a.(1)(a) and (b)}

Management shall:

1. Provide and maintain the necessary fire protection staff and resources to develop and maintain the fire protection program, and provide technical expertise to achieve the U.S. Department of Energy's (DOE) fire protection goals and requirements.

2. Minimize the potential for the occurrence of a fire or related perils.

3. Ensure that fire does not cause an unacceptable onsite or offsite release of hazardous material (HAZMAT) that will threaten the public health and safety or the environment.

4. Establish and define the requirements that will provide an acceptable degree of life safety to DOE, contractor personnel, and the public from fire in DOE facilities.

5. Ensure that vital DOE programs will not suffer unacceptable delays as a result of fire and related perils.

6. Ensure that property damage from fire and related perils does not exceed DOE established levels.

7. Provide fire protection technical assistance to DOE as requested.

Management is responsible for executing the procedures in this program and for adhering to the requirements of the fire protection program for the facilities and/or operations under their jurisdiction. Whenever the requirements cannot be met, management shall consult with a representative from the Fire Protection Engineering group and the Fire Department to determine the compensatory measures that must be implemented until compliance is achieved or an equivalent level of protection is provided.

If an exemption request is required, or an equivalent approach needed, the organization manager shall be responsible for preparing the request and submitting it to Fire Protection Engineering for review and concurrence.

Program managers are responsible for ensuring that funding is secured for correcting fire protection deficiencies in programs or facilities, and for consulting with Fire Protection Engineering for prioritization of the deficiencies.

Facility managers are responsible for ensuring that fire protection equipment in the buildings under their jurisdiction is in full operating condition, and for initiating corrective action when repairs or maintenance are required.

When there is a conflict between the requirements of this program and those of another discipline (e.g., security), the manager of Fire Protection Engineering and/or the fire chief, depending on the area involved, are responsible for resolving the conflict with the manager of the other discipline. If a resolution cannot be reached, the issue shall be escalated to the next level(s) of management until the issue is resolved.

2.2 CHARTER

A charter should be included that specifically identifies the responsibilities and authority of the Fire Protection Organization or those departments responsible for the site fire protection program. The following serves as an example for one organization, but the same approach should also be used to clearly identify the responsibilities and inter-department relationships between other organizations such as the Fire Department or Fire Systems Maintenance group. {Reference DOE 5480.7A, Section 9.a.(1)(c)}

Fire Protection Engineering is responsible for the development of the Fire Protection Program to meet the criteria and goals established by the DOE. Fire Protection Engineering shall assist the other departments and operations with the implementation of the Fire Protection Program, and provide interpretations and guidance to ensure compliance with DOE orders, standards, and codes affecting fire protection. In addition, Fire Protection Engineering responsibilities shall entail the following as a minimum:

1. Review and approve designs; specifications; modifications; fire system acceptance test procedures; fire system testing, inspection, and maintenance procedures; and fire equipment procurement.

2. Perform fire protection self-survey facility appraisals.

3. Assist in the prioritization of fire system repairs.

4. Prepare the annual fire protection report.

5. Perform fire protection program appraisals.

6. Perform NFPA 101 (Life Safety Code) evaluations.

7. Assist in fire investigations.

8. Develop Fire Protection Engineering requirements and implementing

procedures.

9. Exercise authority to stop work upon observing an imminent hazard.

10. Perform fire department operations

11. Perform HAZMAT response

12. Maintain a fire prevention program

13. Perform emergency medical response

14. Maintain prefire plans

15. Review and approve fire protection training programs.

16. Obtain fire protection equipment procurement approval.

2.3 ORGANIZATIONAL STRUCTURE

The purpose of this section is to provide a clear and concise chart, and/or description on how and where fire protection fits into the overall organization of the company. The following serve as examples. {Reference DOE 5480.7A, Section 9.a.(1)(c)}

EXAMPLE A

The Fire Protection Program is administered by two departments: Fire Protection Engineering and Fire Department Operations. Both department managers report to the manager of Safety, who reports to the director of Safety, Environment, and Health. The director reports to the company president.

President

Director,
Safety, Environment, and Health

Manager, Safety	Manager, Environment	Manager, Health

Manager,
Fire Protection Engineering

Manager (Chief),
Fire Department Operations

Manager,
Industrial Safety

Manager,
Radiological Safety

EXAMPLE B

The Fire Protection Program is administered by three departments: Fire Protection Engineering, Fire Department Operations, and Fire Protection Oversight and Assessment. Fire Protection Engineering reports to the director of Engineering, Fire Department Operations reports to the director of Safety and Support Services, and Fire Protection Oversight and Assessment reports to the director of Oversight and Assessment. Each director reports to the company president.

Fire Protection Oversight and Assessment performs independent reviews, establishes program criteria, and evaluates compliance with the Fire Protection Program as administered by Fire Protection Engineering and Fire Department Operations.

President

Director, Engineering	Director, Safety & Support Services	Director, Oversight & Assessment
Manager, Fire Prot. Engineering	Manager, Fire Department Operations	Manager, Engineering O&A
Manager, Chemical & Process Engineering	Manager, Security Operations	Manager, Safety O&A
Manager, Industrial Engineering	Manager, Industrial Safety & Health	Manager, Support Services O&A

2.4 STAFFING

The purpose of this section is to briefly describe the personnel that constitute the fire protection staff. This would include Fire Protection Engineering, fire departments or brigades, fire system maintenance and testing, and emergency response such as HAZMAT and medical staff if they are part of the fire department. The following serves as an example. {Reference DOE 5480.7A, Sections 8.i.(8) and 9.a.(1)(c)}

The fire protection staff include the following personnel. Fire Protection Engineering has one manager, five engineers, and one secretary. The fire department includes the chief, deputy chief, and four platoons each consisting of a captain, lieutenant, and five firefighters. In addition, there are three fire fighters specifically trained for HAZMAT response, three medical technicians, and two secretaries.

There are seven technicians that perform fire system testing, and they are part of Fire Department Operations. The fire system maintenance group has six craft people responsible for all maintenance activities on fire protection systems.

2.5 QUALIFICATIONS

The purpose of this section is to include any specific company qualification requirements as well as a short description of the qualifications of each of the fire protection staff members identified in the section above. A complete resume of each individual is not necessary, but the information should be sufficient so it is clear the individuals are qualified for the positions. The following serves as an example of company-specific qualifications as well as those for each individual. {Reference DOE 5480.7A, Section 8.i.(8)}

The Fire Protection Engineering staff shall have at least one individual with a bachelor of science degree in a engineering or related technical field. This person shall also meet the qualifications for member grade in the Society of Fire Protection Engineers (SFPE) or be a registered professional engineer in fire protection.

The fire department personnel shall meet or have a program in place enabling its staff to meet the requirements provided in the following National Fire Protection Association (NFPA) Standards where applicable:

NFPA 1001, "Fire Fighter Professional Qualifications"
NFPA 1002, "Fire Apparatus Driver/Operator Professional Qualifications"
NFPA 1021, "Fire Officer Professional Qualifications"
NFPA 1031, "Professional Qualifications for Fire Inspector"
NFPA 1033, "Fire Investigator Professional Qualifications"
NFPA 1041, "Fire Service Instructor Professional Qualifications"
NFPA 1501, "Fire Department Safety Officer"

The fire system testing and maintenance personnel shall receive a minimum of 40 hours training per year. The training shall be both general and specific to the fire systems installed at the site.

FIRE PROTECTION ENGINEERING

Name	Position	Experience	Education
AC Pile	Manager	15	M.A. Business Management B.S. Mechanical Engineering
JW Teets	Engineer	12	B.S. Fire Protection Engineering
MH Fish	Engineer	10	B.S. Civil Engineering
JJ Tire	Engineer	9	B.S. Mechanical Engineering
ST Sure	Engineer	5	B.S. Fire Protection Engineering
DF Comply	Engineer	2	B.S. Electrical Engineering

2.6 FIRE PROTECTION EXEMPTIONS

This section should include the specific requirements for processing an exemption request as required by DOE Orders 5480.4 and DOE 5480.7A. It should also include a list of all fire protection exemptions approved or awaiting disposition for the specific site. The following serves as an example. {Reference DOE 5480.7A, Section 8.i.(7)}

When compliance cannot be achieved with a non-statutory code, standard or DOE Order, an exemption request (temporary or permanent as applicable) shall be submitted to the DOE. The exemption shall be processed in accordance with DOE Order 5480.4 and include the following information as a minimum:

1. The specification of the standard from which the exemption is being requested.

2. Detailed statements as to why compliance with the requirement cannot be achieved.

3. A description of what measures will be implemented and maintained to provide equivalent protection to the requirement.

4. An analysis of the benefit gained or negative impact avoided by receiving the exemption vs. the worst probable incident that may occur under the exemption.

5. For temporary exemptions, a statement of when compliance will be achieved, and what actions have been and will be taken to meet compliance. A temporary exemption may be in effect for the time required to achieve compliance, but is not to exceed one year. In some cases, the exemption may be renewed.

The fire protection exemption requests approved for the ____ site include the following:

Date	Subject	Building/Program
10/83	Inspect. of control valves	Sitewide
1/85	Stairwell widths	221T
4/91	Potential property loss > $1M	735/Isolation Project

2.7 FIRE PROTECTION EQUIVALENCIES

This section should include the specific requirements for processing an equivalency request as required by DOE Order 5480.4. It should also include a list of all fire protection equivalencies approved or awaiting disposition for the specific site. The following serves as an example, but keep in mind it is always helpful to provide as much supporting documentation (drawings, analysis, documents, etc.) as possible when submitting the request. {Reference DOE 5480.7A, Section 8.i.(7)}

When compliance cannot be achieved with the required DOE orders or mandatory codes and standards, and an alternate method of compliance is needed or desired, the equivalency concept shall include the following information as a minimum and be processed in accordance with the criteria outlined below.

1. The specification of the standard for which the equivalency is being requested.

2. Detailed statements as to why compliance with the requirement cannot be achieved and why an alternate method is needed or desired.

3. A description of the alternate method and an explanation of how this method provides protection that is equivalent to the original requirement.

4. The equivalency concept shall be submitted to the DOE Field Office for approval.

5. The equivalency concept may be approved on a temporary or permanent basis.

The fire protection equivalencies approved for the ____ site include the following:

Date	Subject	Building/Program
12/80	Fire barrier sealant	324
1/84	Two means of egress	457
7/90	Excessive travel distance	951 Tunnels

2.8 FUNDING PRIORITIZATION OF FIRE PROTECTION ITEMS

The purpose of this section is to ensure funding is secured for fire protection deficiencies and projects of high priority. A priority matrix should be in place so deficiencies and projects can be evaluated based on the relative risk associated with each item. The idea is to prioritize projects as well as findings resulting from internal and external surveys, appraisals, and audits. This prioritization scheme is not intended to include maintenance type items, but it could probably be modified to serve both purposes if desired. There are other prioritization methods available, besides the example provided below that could also be used or adapted for this purpose. The main point is that a system be in place to address this issue. The following serves as an example of a scheme for projects and deficiencies only. {Reference DOE 5480.7A, Section 9.c.(2)}

A list of all open fire protection items (such as unfunded projects and findings from internal and external surveys, appraisals, and audits) shall be established and maintained. Each item shall be prioritized based on the potential risk to assist management in the budgeting process, and to ensure

that higher risk items receive priority funding. The following prioritization levels shall be used to identify the importance of each item.

PRIORITY I: A deficiency that presents an imminent threat to personnel safety or the environment, and warrants immediate compensatory action and/or correction. Priority I issues should be conveyed to plant and DOE management upon discovery for immediate action.

PRIORITY II: A deficiency that may present a threat to personnel safety or the environment and must be corrected.

PRIORITY III: A deficiency that presents little threat to personnel safety or the environment, but, if corrected, would improve the effective implementation of the fire protection program.

3.0 FIRE PROTECTION ENGINEERING

3.1 FIRE PROTECTION CRITERIA AND REQUIREMENTS

The program should have a section that gives the baseline fire protection criteria for the program as well as for design, modifications, and quality control/assurance. The following serves as an example. {Reference DOE 5480.7A, Section 5}

The following documents are the baseline criteria of the Fire Protection Program. The program shall be administered to provide and maintain compliance with these requirements as a minimum. The fire protection related codes and standards in effect when facility design commences (code of record) shall remain in effect for the life of the facility.

When substantial upgrades or modifications are made, the current edition of the code shall apply to the upgrade or modification. Also, if there is a significant hazard that endangers building occupants, the public, or the environment as determined by the authority having jurisdiction (AHJ), the facility shall be upgraded to the requirements of the current edition of the code or standard.

1. DOE Order 5480.7A, *Fire Protection*

2. DOE Order 6430.1A, *General Design Criteria*

3. NFPA Codes and Standards

4. *Code of Federal Regulations*, Title 29, Parts 1910 and 1926 (29 CFR 1910 and 1926)

5. DOE/EP-0108, *Standard for Fire Protection of AEC Electronic Computer Data Processing Systems*

6. DOE/EV-0043, *Standard on Fire Protection for Portable Structures*

7. DOE Order 5480.4, *Environmental Protection, Safety, and Health Protection*

Designs for all new construction and modifications to existing facilities and systems shall be reviewed in accordance with the Design and Modification Reviews section of this program.

To ensure quality construction is provided for all fire protection work, all equipment installed shall be listed or tested by a nationally recognized laboratory for fire protection application. Acceptance test procedures shall also be performed for each new or modified fire protection system to ensure it functions as designed.

3.2 TECHNICAL LIBRARY

There is a definite need for a comprehensive technical library to assist the fire protection professional in accomplishing the goals of the fire protection program. Since many times technical resources are taken for granted by those unfamiliar with their need, the program should include a section which requires that such a library be maintained with at least the main fire protection codes and standards and DOE Orders. The following serves as an example:

Fire Protection shall maintain a current technical library that includes as a minimum the following resources:

1. DOE Order 5480.7A, *Fire Protection*

2. DOE Order 6430.1A, *General Design Criteria*

3. NFPA Codes and Standards

4. 29 CFR 1910 and 1926

5. DOE/EP-0108, *Standard for Fire Protection of AEC Electronic Computer Data Processing Systems*

6. DOE/EV-0043, *Standard on Fire Protection for Portable Structures*

7. Product directories of "Underwriters Laboratories," along with the periodic supplements

8. Factory Mutual Research Corporation Approval Guide

9. Other applicable DOE orders

10. DOE Fire Protection Resource Manual

Desired referenced material includes the following:

11. NFPA Handbooks

12. NFPA guides, manuals, and recommended practices

13. Factory Mutual Loss Prevention Data Sheets

14. SFPE Handbook

15. DOE *Explosives Safety Manual*, DOE/EV/06194

16. American Petroleum Institute Guidelines

17. Local and state fire protection criteria

3.3 DESIGN AND MODIFICATION REVIEWS

It is imperative that a review process be in place to ensure new designs and modifications to existing facilities, fire system testing and maintenance procedures, and other documents related to fire protection are evaluated for compliance. The purpose of this section is to document and explain how the review process operates at your specific site, and how fire protection interfaces with the process. Comments generated as part of the review process, and the resolution of those comments, should be documented and filed. Providing a matrix or flow chart illustrating the review process would also be appropriate. The following serves as an example for these aspects of the program. {Reference DOE 5480.7A, Section 8.i.(2)}

A documented design review program shall be in place to ensure designs; specifications; modifications; fire system acceptance test procedures; fire system testing, inspection, and maintenance procedures; and fire equipment procurement are reviewed and/or approved by Fire Protection Engineering.

The program shall include a formal tracking system for comments made on all items reviewed to ensure comments are appropriately dispositioned. The form provided as Figure 3-1 must be used at the ____ site to record and track comments and their disposition.

The review process at the ____ site operates in the following manner and is documented in the site engineering manual.

All documents and packages are assigned an "impact level," which determines the significance of the package as related to safety in general. The impact level is assigned to the package by the engineer responsible for the package, whether it be a new project, a modification, or a test procedure. The impact levels range from 1 to 4 with 1 being the most significant and 4 being the least significant. All packages assigned an Impact Level 1, 2, or 3 are required to be reviewed by fire protection. Packages assigned a Level 4 are typically packages involving replacement of equipment with like kind or similar type work. These do not need a fire protection review.

The engineer responsible for the package and assigning the impact level is also responsible for distributing the package to the Central Document Review Office (Central Office). This office then transmits a copy of the package to the different disciplines for review based on a preestablished list. Once reviewed, the packages are returned to the Central Office with any comments. The engineer must resolve comments with the comment originators before the package will be officially released (Figure 3-2 and Table 3-1).

Figure 3-1

COMMENT REVIEW FORM

DATE_____ REVIEW #_____ PROJECT #_____

DOCUMENT #/TITLE PROGRAM/BUILDING #

REVIEWER_____ LOCATION/PHONE_____

AGREEMENT WITH COMMENT DISPOSITION
REVIEWER_____
COGNIZANT ENGINEER_____
DATE_____

ITEM(S) CLOSED
REVIEWER_____
COGNIZANT ENGINEER_____
DATE_____

ITEM#	COMMENT	DISPOSITION	STATUS
1.			
2.			

Figure 3-2. Review Process.

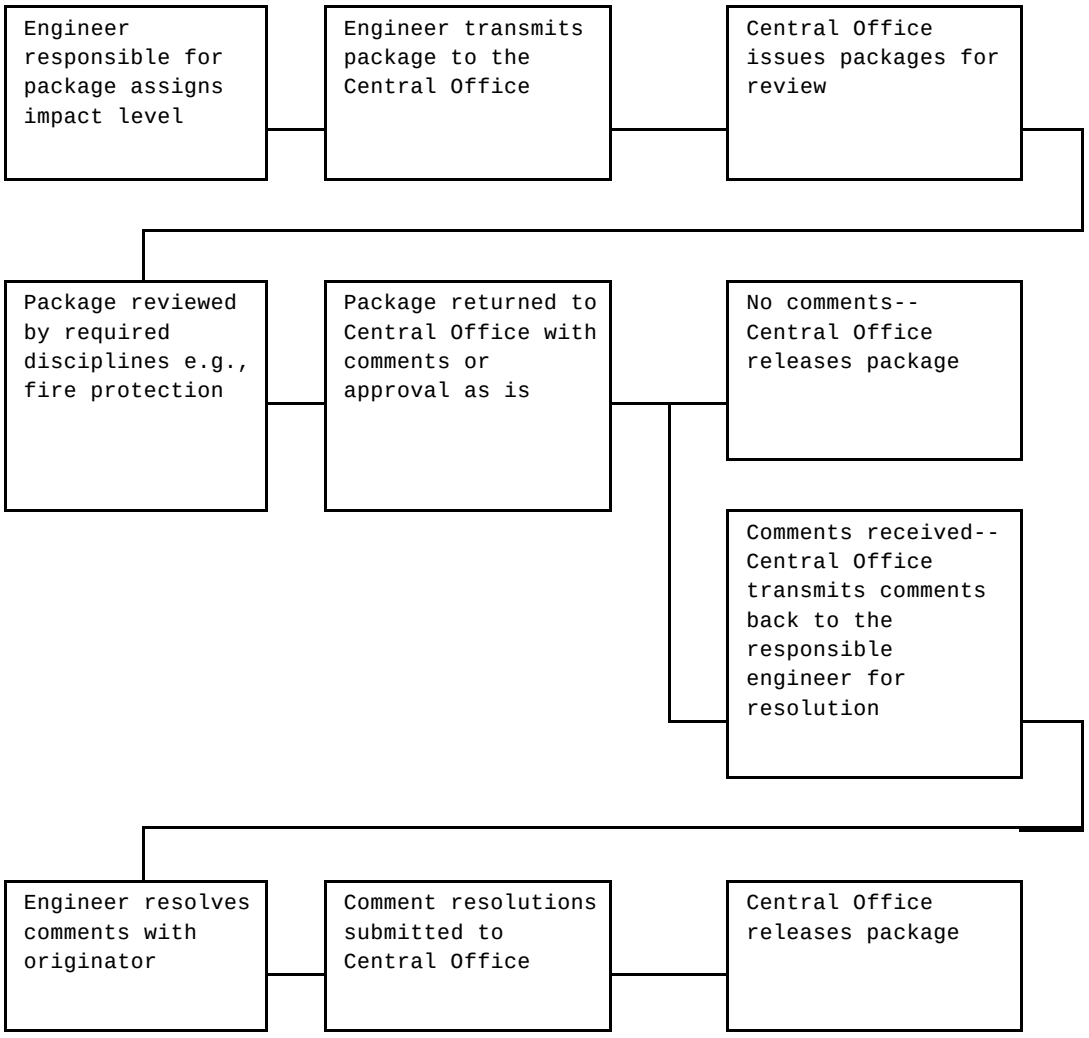

Table 3-1. Design and Package Review Discipline Matrix.
(sheet 1 of 2)

Subject	Fire Prot. Engineering	Industrial Safety	Industrial Hygiene	Fire Department	Environmental Protection	Security	Program Division
Site access	x			x		X	x
Flood control					x		
Emergency equipment deployment	x			x		x	
Exit design	x			x		x	x
Process equipment placement		x			x		x
Water supply	x			x			x
Fire water mains	x			x			
Hydrants	x			x			
Spill control	x			x	x		x
Gas distr. systems	x	x	x	x	x		x
Hazardous material traffic routes				x	x		
Fencing locations	x			x		x	x
Security control	x			x		x	x
Fire walls	x			x			x
Access ladders	x	x		x		x	x
Flammable/ combustible liq. storage	x		x	x			
Explosion equipment	x		x	x			
Fire exting.	x						
Automatic sprinklers	x			x			
Carbon dioxide, dry chemical, and foam systems	x		x	x	x		

Table 3-1. Design and Package Review Discipline Matrix.
(sheet 2 of 2)

Subject	Fire Prot. Engineering	Industrial Safety	Industrial Hygiene	Fire Department	Environmental Protection	Security	Program Division
Liquid run-off control	x			x	x		x
Fire/smoke dampers	x			x			
HVAC design*	x		x				
Fire alarm systems	x			x			
Emergency power	x	x		x		x	x
Electrical transformers	x			x	x		x
Exit signs and emergency lights	x			x			x
Gloveboxes	x	x	x				x
Inert systems	x		x	x	x		x

*HVAC = Heating, ventilation, and air conditioning.

The lists provided below may be used to ensure a thorough review is completed. The lists are not inclusive.

1. Site and site utility drawings

   a. Accessibility
   b. Flood control
   c. Emergency personnel and equipment deployment
   d. Environmental control
   e. Process, equipment, material spacings
   f. Water supplies
   g. Firewater mains
   h. Hydrants
   i. Flammable liquid spill control
   j. Gas distribution systems
   k. HAZMAT traffic routes
   l. Fencing locations
   m. Security control

2. Architectural drawings

   a. Building code compliance (fire protection)
   b. Roof drains
   c. NFPA 101 compliance

d. Storage (high piled, vital documents, computer tapes, etc.)
e. Fire walls (protected openings)
f. Access ladders
g. Security access control
h. Flammable and combustible liquid storage
i. Explosion relief
j. Fireproofing
k. Construction materials
l. Maximum possible and maximum credible fire loss potentials
m. Placement of portable fire extinguishers
n. Emergency response access
o. Classification of hazardous areas
p. Smoke venting
q. Combustible dust handling
r. Roof construction

3. Pipe drawings

a. Automatic sprinklers, water spray systems
b. Standpipe systems
c. Carbon dioxide (CO_2), foam, dry chemical systems
d. Chemical distribution systems
e Compressed gas distribution systems
f. Emergency venting
g. Tank car, truck loading, and unloading
h. Liquid runoff control
i. Piping identification

4. HVAC drawings

a. Fire and smoke dampers
b High temperature and smoke interlocks
c. Construction materials
d. Access ports
e. Fire protection coatings
f. Vapor removal systems
g. High-efficiency particulate air (HEPA) filter protection

5. Electrical drawings

a. "Classified Hazardous Areas"
b. Fire alarm and detection systems
c. Emergency evacuation systems
d. Accessibility of equipment
e. Emergency power (lights, critical equipment, etc.)
f. Lightning protection
g. Cable tray design
h. Critical equipment water shielding
i. Transformer protection and fluids
j. Placement of exit signs
k. Grounding and bonding

6. Other

a. Fire water and criticality concerns
b. Storage and operating tanks and vessels
c. Material handling and identification
d. Conveyor systems
e. Monitoring systems
f. Gloveboxes
g. Mutual aid
h. Inert systems
i. Occupational Safety and Health Administration (OSHA) requirements

3.4 DESIGN SPECIFICATIONS

This section should include as a minimum, the basic design requirements for fire protection. When available, standard design specifications should be included in this section along with any site specific specifications. The following serves as an example. {Reference DOE 5480.7A, Section 8.i.(2)}

All fire protection designs shall use state-of-the-art equipment that has been tested by a nationally recognized testing laboratory for its intended use. All equipment components shall be compatible with existing equipment and installed as required by the applicable NFPA codes and standards.

Written acceptance test procedures shall be prepared and executed for all new fire protection system installations or modifications to verify that fire protection systems perform as required. Any deficiencies noted during the tests shall be documented and tracked until resolved or corrected.

When site-specific guides or design specifications exist, they shall be included in all fire protection design packages as applicable. All fire protection specifications shall be reviewed by the fire protection site staff.

3.5 OPERABILITY REQUIREMENTS

The operability requirements in Appendix A are examples of procedures that may be implemented to ensure fire protection systems are maintained in operational readiness. {Reference DOE 5480.7A, Section 9.c.(4)}

3.6 EQUIPMENT PROCUREMENT APPROVAL

The purpose of this section is to include requirements that ensure all equipment purchased for fire protection has been tested or approved for its intended use by a nationally recognized testing laboratory. In any case, all fire protection equipment purchases, except exact replacements, should be approved by Fire Protection Engineering. The following serves as an example. {Reference DOE 5480.7A, Section 8.i.(2)}

All equipment procured for fire protection application must be tested or

approved for its intended use by a nationally recognized laboratory. Fire Protection Engineering shall approve all purchase requisitions for fire protection equipment, except exact replacement items.

3.7 FIRE PROTECTION SYSTEMS TESTING, INSPECTION, AND MAINTENANCE

The purpose of this section is to identify the testing, inspection, and maintenance frequency requirements for fire protection equipment based on the applicable NFPA requirements, e.g. NFPA 25, NFPA 72H, etc. A list should be generated which identifies the frequencies being followed at each site. In several areas, NFPA does not include frequency requirements, but only suggested frequencies are given in the code appendixes. The NFPA standards should be reviewed since they provide additional "notes" and points of clarification which may be useful if included in the frequency schedule.

The actual frequencies may vary depending on the specific sites and contractual agreements. In some cases, sites may have received exemptions to the NFPA frequencies and be implementing a modified schedule. In these situations, the modified schedule for the site should be listed in this section.

In Appendix B examples of testing and maintenance procedures for various fire systems and components are presented. Specific procedures tailored to each fire protection system for testing, maintenance, and inspections should be developed. When developing this part of the fire protection program, DOE Order 4330.4A, "Maintenance Management Program" should also be consulted. {Reference DOE 5480.7A, Section 9.b.(5)}

3.8 INSPECTION, TESTING, AND MAINTENANCE PROCEDURES

A complete listing of these procedures is found in Appendix B. *{Reference DOE 5480.7A, Sections 9, 9.b.(5), and 9.c.(1)}*

3.9 MAINTENANCE PRIORITIZATION SCHEME

A maintenance prioritization scheme ensures that fire protection items requiring repair or maintenance are attended to in a timely manner. The scheme should include different priority levels so the severity or importance of the items can be designated. This scheme is particularly useful when there is a backlog of items, but should not be considered irrelevant when a backlog does not exist. The following serves as an example. {Reference DOE 5480.7A, Sections 9 and 9.b.(5)}

A maintenance prioritization scheme shall be in place so all fire protection items requiring repair or maintenance are appropriately prioritized regarding their significance. The prioritization levels shall be defined as follows.

PRIORITY I: An impairment to a fire protection system that creates an imminent hazard to employees, property, or the potential

for an environmental release in excess of allowed limits. Priority I items are considered an emergency condition.

PRIORITY II: An impairment to a fire protection system that reduces the protection to employees, property, or the environment, but is not an imminent hazard.

PRIORITY III: An impairment to a fire protection system that must be corrected, but does not directly reduce the protection to employees, property, or the environment.

3.10 CORRECTIVE ACTION TRACKING SYSTEM

A formal corrective action tracking system should be in place at each site for all findings or recommendations resulting from internal and external appraisals and audits. As a minimum, the tracking system should include the information provided in the example below. {Reference DOE 5480.7A, Section 9.c.(2)}

All findings resulting from fire protection facility and program appraisals, both internal and external, shall be placed on a corrective action tracking system until resolved or completed. The tracking system shall include the following input data as a minimum:

1. The finding text
2. The structure, building, or area affected
3. The date of the appraisal
4. Name of the appraiser
5. Name of the person responsible for corrective action
6. Corrective action due date
7. The interim compensatory measures required
8. Priority level of the finding
9. Closure date.

3.11 PROPERTY LOSS CRITERIA

The baseline property loss criteria required by the DOE Orders should be included in this section. It would also be appropriate to include any additional criteria that is site specific. The following serves as an example. {Reference DOE 5480.7A, Section 9.b.(3),(4),(6),(8), and 9.c.(3)}

1. Apply the following criteria to reduce the potential property loss from a fire. Additional criteria are located in DOE Order 5480.7A, *Fire Protection*, and DOE Order 6430.1A, *General Design Criteria*. Provide and install complete automatic fire suppression systems per the applicable NFPA standards for

   a. All new structures over 5,000 ft^2

   b. All structures having a maximum possible fire loss (MPFL) in excess of $1 million, or where the maximum credible fire will

result in the loss of a vital structure for a period longer than that specified as acceptable by the program senior official.

2. Provide a redundant fire protection system, when the MPFL exceeds $50 million, to limit the loss to this figure. *Reference DOE 5480.7A for the definition of a redundant fire protection system.*

3. Provide a redundant fire protection system and a 3-hour rated fire barrier or physical separation, when the MPFL exceeds $150 million, to limit the loss to this figure.

4. Construct all new structures over 5,000 ft^2 of noncombustible or fire resistive materials.

5. The water supply for fire protection shall have a minimum supply duration of 2 hours. Facilities having a MPFL in excess of $50 million shall have an additional independent source of fire protection water.

   A combined fire and process or domestic water system shall be able to supply the fire demand plus the maximum daily domestic demand for the required duration.

6. Maintain a watchman service or fire watch whenever a fire protection system is out of service. Determine the frequency of the service or watch based on the importance of the facility and program it supports, the potential property loss, and the potential impact to the environment. In no case shall the watch frequency be less than once every 2 hours.

3.12 FIRE INVESTIGATIONS AND REPORTS

The purpose of this section is to identify the requirements on how fire investigations and reports must be conducted and written. Specific guidance may be provided to the extent needed to ensure compliance is achieved. The following serves as an example.

Prepare and perform fire investigations and reports in accordance with DOE Order 5484.1, *Environmental Protection, Safety, and Health Protection Information Reporting Requirements*, and DOE Order 5000.3A, *Occurrence Reporting and Processing of Operations Information*.

In addition, perform all field reporting in accordance with NFPA 902M and NFPA 904Ml. See Section 6.0, "Fire Department Operations and Emergency Response."

3.13 ANNUAL REPORT

This section identifies the requirement for preparing an annual property loss report per DOE Order 5484.1, and the specific topics that should be

included in the report. The following example includes the topic areas that should be addressed, as a minimum, to the extent that they apply to the site.

Prepare and submit the "Annual Industrial Summary of Fire and Other Property Damage" report to the DOE Operations Office each year per DOE Order 5484.1. The summary shall include the following information as a minimum:

1. Loss experience analysis
2. Losses of interest
3. Replacement property values
4. Recurring fire protection costs
5. CY xx major fire protection accomplishments
6. CY xx major fire protection objectives, planned improvements, and construction activities
7. Appraisal program
8. Extinguishing system performance
9. Items of interest
10. Notable personnel actions
11. Major third party (DOE Headquarters [DOE-HQ], Tiger Team, etc.) fire protection appraisal findings and recommendations for the reporting year.

3.14 FIRE PREVENTION PROCEDURES AND PRACTICES

The purpose of the fire prevention, fire protection, and special hazard procedures is to provide requirements for first level management to implement and to assist in maintaining a fire protection program consistent with the goals of DOE Order 5480.7A. The procedures are primarily intended to ensure specific existing programs and systems are maintained in excellent operation. In some cases, design criteria is included depending on the subject of the procedures. {Reference DOE 5480.7A, Section 9.c.(1)}

The list of procedures in Appendix C are not inclusive, but are considered the areas that should be addressed at each site as a minimum, *where applicable. Depending on the specific sites, additional procedures may be warranted. For example, procedures for "Safe Shutdown Protection," "Hot Cells," "Anechoic Chambers," and "Accelerators" would be appropriate for some sites and would be expected to be included in their program.*

3.15 FIRE PROTECTION PROCEDURES AND PRACTICES

A complete listing of these procedures is found in Appendix D.
{Reference DOE 5480.7A, Section 9.c.(1)}

3.16 SPECIAL HAZARDS PROTECTION PROCEDURES AND PRACTICES

A complete listing of these procedures is found in Appendix E.
{Reference DOE 5480.7A, Section 9.c.(1)}

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4.0 ENVIRONMENTAL AND PUBLIC PROTECTION

4.1 FACILITY OPERATING PROCEDURES

The purpose of this section is to require the operating procedures of major facilities, or facilities with special or unique processes, to address the fire protection limitations in their operating procedures. Fire protection systems and features are usually in place to ensure safe operations, protect the environment, and enhance personnel safety. If these systems or features are out-of-service or breached, compensatory measures are usually needed to maintain safe operations. These aspects of, and limitations in, operations should be part of a facility's operating procedures or technical specifications. The following serves as an example for this requirement. {Reference DOE 5480.7A, Section 9.c.(4)}

Facility operating procedures or technical specifications shall address the fire protection features of the facility that are required for safe operation and mitigating potential fire hazards and damage. When a facility's fire protection feature is out-of-service or damaged, compensatory measures shall be implemented until the system or equipment is restored to service. The operating procedures shall specifically define the compensatory measures to be implemented consistent with the significance of the impairment.

4.2 SAFETY ANALYSIS REPORTS

Safety analysis reports (SAR) typically address fire risks from a radiological standpoint and fail to review the fire protection features of a facility consistent with the goals and criteria of DOE Order 5480.7A. This section provides requirements to ensure the SARs evaluate the fire protection features of a facility in accordance with DOE Order 5480.7A. One way to accomplish this is to require that a Fire Hazard Analysis be performed as part of the SAR, using the criteria from DOE Order 5480.7A. The following serves as an example. {Reference DOE 5480.7A, Section 9.a.(3)}

All SARs shall include a Fire Hazard Analysis that addresses, as a minimum, the items identified in Section 4.3, "Fire Hazard Analysis." The SAR shall also identify the fire protection features that are required for safe operation and mitigating potential fire hazards and damage, as well as the compensatory measures required if a system is impaired or damaged (see Section 4.1, "Facility Operating Procedures").

4.3 FIRE HAZARD ANALYSIS

Until the reissue of DOE Order 5480.7A, there was no guidance within the DOE for performing fire hazard analysis. With the requirements now established in this order, site fire protection programs should include them to improve awareness and promote consistency in this area. The following serves as an example of how this could be addressed in a site fire protection program. {Reference DOE 5480.7A, Section 9.a.(3)}

All new facilities shall have a Fire Hazard Analysis. Each facility required to have a SAR shall include a Fire Hazard Analysis as part of that report. A list shall be maintained of all facilities required to have a Fire Hazard Analysis, which shall address the following items as a minimum:

1. Description of construction
2. Essential safety class systems
3. Fire protection features
4. Description of fire hazards
5. Life safety considerations
6. Critical process equipment
7. High value property
8. Damage potential: MPFL and maximum credible fire loss (MCFL)
9. Fire department and brigade response
10. Recovery potential
11. Potential for a toxic, biological, and/or radiological incident due to fire
12. Emergency planning
13. Security and safeguards considerations related to fire protection
14. Natural hazards (earthquake, flood, wind) impact on fire safety
15. Exposure fire potentials.

4.4 FACILITY CONTAINMENT AND CONFINEMENT

Many sites have facilities that require special ventilation protection to preclude the potential for an offsite release of hazardous material. DOE Order 6430.1A has requirements and general guidance in this area, but due to its importance, the area should be further addressed in site fire protection programs when applicable. It would also be appropriate to reference the DOE Filter Plenum Fire Protection Criteria *for further guidance in this area. The*

following serves as an example. {Reference DOE 5480.7A, Section 9.b.(12)}

Facility ventilation systems and structures shall be protected against fire to preclude the release of radioactive, toxic, or other hazardous materials above established limits. Alternatives to consider for accomplishing this goal may include the following:

- Use of sand filters
- Automatic water spray systems with demisters
- Fire screens
- High temperature HEPA filters.

In addition, the "Filter Plenum Fire Protection Criteria" shall be used to assist in determining the level of protection needed.

4.5 LIQUID RUN-OFF CONTROL

Specific requirements for liquid run-off control have not been developed within the DOE due to the variation in conditions on this subject. Nevertheless, the subject should still be addressed in the site fire protection program. There has been several criteria used for determining liquid run-off control measures, and these should be considered when evaluating each condition.

For example, the Uniform Fire Code, Article 80, requires the containment to be sized based on the design flow rate or system design area for a period of 20 minutes. DOE Order 6430.1A, Section 1540, requires a collection system to be sized based on the maximum amount of water that would be collected in fighting the design basis fire. DOE Order 5480.7A requires controls to be developed after consulting with the DOE fire protection engineer. The following example includes the wording from DOE Order 5480.7A. {Reference DOE 5480.7A, Section 9.b.(10)}

Natural or artificial means of controlling liquid run-off from a credible fire shall be provided so that contaminated or polluting liquids will not escape the site, including potentially contaminated water resulting from firefighting operations. The amount of fire water that must be controlled and the design of the containment system shall be determined on a case by case evaluation.

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5.0 APPRAISAL PROGRAM

5.1 FIRE PROTECTION SELF-SURVEY FACILITY APPRAISALS

DOE Order 5480.7A requires sites to have a self-survey appraisal program in place to ensure their facilities meet the DOE fire protection goals and requirements. The following is an example that tracks closely with the requirements of DOE Order 5480.7A. When addressing this part of the Fire Protection Program, consideration should also be given to developing a site building list that includes the survey frequency required for each building. {Reference DOE 5480.7A, Section 9.a.(2)(b) and (c)}

Perform Fire Protection Program facility appraisals on each facility based on the following frequencies:

- Annually--Appraise facilities plus equipment valued at $50 million or more, or where classified as a moderate or high hazard facility per DOE Order 5480.1B, or where classified as Category 1 or 2 per DOE 5480.23.

- Every 2 years--Appraise facilities plus equipment valued at $10 million to $50 million.

- Every 3 years--Appraise facilities plus equipment valued less than $10 million.

The appraisal report shall address the following items as a minimum, and appraisal findings shall be placed on the tracking system with the expected completion date until resolved.

(a) Fire protection of safety class systems
(b) Life safety
(c) Vital programs
(d) Fire protection of high value property
(e) Inspection, testing, and maintenance reports
(f) Suppression equipment
(g) Water run-off
(h) Prefire plans
(i) Fire apparatus accessibility
(j) Administrative controls
(k) Temporary protection and compensatory measures
(l) Completeness of fire hazards analysis
(m) Fire barrier integrity
(n) Fire loss potentials (MPFL and MCFL)
(o) Suppression system tests, water supplies
(p) Maintenance procedures for maintaining systems
(q) Status of findings from previous survey
(r) New findings resulting from the current survey.

Based on the above criteria, the appraisal frequency required for the site facilities is as follows:

Annual	2 Years	3 Years
Bldg. 203	564	234
153	125	974
645	867	298

5.2 FIRE PROTECTION PROGRAM APPRAISALS

DOE Order 5480.7A also requires sites to have a self-appraisal performed on their fire protection programs to ensure compliance with the DOE fire protection goals and requirements. The following is an example that tracks closely with the requirements of DOE Order 5480.7A. In some cases, it may be appropriate to include additional site-specific areas for review. {Reference DOE 5480.7A, Section 9.a.(2)(b)}

Perform an annual appraisal of the Fire Protection Program that evaluates the following areas as a minimum:

- Comprehensiveness of the Fire Protection Program
- Procedures for engineering design and review
- Procedures for maintenance, testing, and inspection of fire protection equipment and systems, including water supplies
- Fire protection engineering staff (number, qualifications, training)
- Fire suppression organization (personnel and training)
- Fire suppression mutual aid agreements
- Management support
- Exemptions and documented equivalencies
- Inspection, testing, and maintenance reports
- Adequacy of facility appraisal reports
- Administrative controls
- Temporary protection and compensatory measures
- Status of previous appraisal findings
- New appraisal findings.

5.3 LIFE SAFETY CODE EVALUATIONS

DOE facilities must comply with the NFPA 101 Life Safety Code. The best way to demonstrate compliance is to perform an evaluation on the facilities. The evaluations could be included as part of the self-survey facility appraisals or performed as a separate review. In any case, there are specific areas that should be reviewed. The following serves as an example. {Reference DOE 5480.7A, Section 9.b.(2)}

Conduct NFPA 101 evaluations for all facilities. The evaluations may be included in the fire protection self-survey facility appraisals or completed as a separate report. The following areas should be addressed as a minimum (as they apply to the occupancy) when performing the evaluations:

- Exit capacity
- Exit enclosures and discharge
- Arrangement of exits
- Travel distance to exits and common path of travel
- Dead-end corridors
- Exit markings and illumination
- Emergency lighting
- Protection for special and high hazard areas
- Vertical openings and penetrations
- Fire alarm systems
- Interior finish
- Security and locking arrangements.

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6.0 FIRE DEPARTMENT OPERATIONS AND EMERGENCY RESPONSE

All fire protection programs should address the professional, manual firefighting capabilities available at their site. The purpose of this section is to give examples of the areas that should be discussed. The type of manual firefighting resources varies significantly across the DOE complex. For example, some sites have their own fully staffed fire departments, others have contract agreements with local city departments or other government agencies, and still others only have the need for small onsite fire brigades. Whatever the arrangement may be, the areas should be addressed as applicable.

Each fire department and emergency response organization should have internal operating procedures. Provided below is a list of some of the most common procedures that one would expect to find within an organization. Examples are provided for items c, h, k, and l in Appendix F. {Reference DOE 5480.7A, Sections 9, 9.a.(1)(c) and 9.b.(7)}

6.1 OPERATING PROCEDURES

A. Officer Assignments
B. Firefighter Assignments
C. Periodic Responsibilities and Duties
D. Uniforms and Bunker Gear
E. Uniform Laundry and Repairs
F. Protective Clothing Inspections
G. Grooming Standards
H. Notification of Absences
I. Building Tours
J. Fire Protection System Impairments
K. Emergency Response Procedure
L. Facility Control in Emergency Situations
M. Firefighting in Radiation Zones
N. Call-In of Off-Duty Personnel

6.2 EMERGENCY EQUIPMENT

The purchase of suppression equipment should comply with DOT requirements, applicable NFPA standards, e.g., NFPA 1901, and site specific needs. There are many pieces of equipment required for firefighting operations, and these items should be inspected and evaluated to ensure they will meet the demanding needs when required. Provided below are a few examples of procedures that address several pieces of equipment. Each department should determine what equipment should have specific procedures developed to address these aspects of application and use. {Reference DOE 5480.7A, Sections 9, 9.a.(1)(c) and 9.b.(7)}

6.2.1 Life Safety Rope, Harnesses, and Hardware

The following guidelines should be observed to provide a reasonable degree of safety for life safety rope, harnesses, and hardware used to support fire service personnel and civilians during rescue, firefighting, and other emergency operations; during training maneuvers; and to comply with NFPA 1983 standards.

6.2.1.1 Life Safety Rope

1. Use life safety rope to support the weight of members and/or other persons during rescue, firefighting, other emergency operations, and during training maneuvers.

2. Remove and destroy life safety rope that is used for any other purpose.

3. Use new, unused life safety rope for rescue at fires or other emergency incidents and destroy it after it is used.

4. Designate life safety rope used for training maneuvers as training rope. It may be reused if inspected before and after each such use in accordance with the manufacturer's instructions.

    a. Destroy training ropes if subjected to impact loading or if signs of weakness or wear are detected. Maintain records of each life safety rope used for training.

5. Dispose life safety rope per battalion commander instructions.

6. Ordinary, unmarked working rope (not life rope) will be used for all other fire ground and training tasks.

6.2.1.2 Life Safety Harness

1. Life safety harnesses shall conform with NFPA 1983.

2. Use harnesses only in accordance with manufacturer's instructions.

3. Inspect harnesses after each use in accordance with manufacturer's instructions.

4. Replace harnesses only in accordance with manufacturer's instructions.

6.2.1.3 Hardware

1. Inspection, maintenance, and retirement criteria shall follow the manufacturer's requirements.

6.2.2 Fire Hose

6.2.2.1 Testing Fire Hose

Inspect and service test all fire hose as specified in NFPA 1962. Testing should be conducted as specified by Fire Department procedures. Hose testing responsibilities are also spelled out in these procedures. A record of hose tested, including hose numbers, must be turned into the platoon station officer in charge of hose records.

All hose on apparatus and storage racks should be laid out in lengths of 300 ft or less and tested to 250 lb pressure for 5 minutes. Tests will include the use of a gate valve to prevent a pressure surge from a broken hose.

Each shift should test, rack, and roll its own hose. In addition, any shift performing testing on hose from hose boxes is responsible for rolling the hose and returning it to the boxes. Hose hung in the tower after testing should be marked to identify the shift performing the testing.

After testing, each section of hose should be marked as tested by writing the year of the test on the hose with an indelible marker. This information should be written on both ends of the hose as near to the couplings as possible.

New hose should be marked with the appropriate year and also should have a line drawn along the hose even with the coupling. This line will aid in determining if the coupling is slipping off the hose. New hose without such markings should not be placed in service.

Metal couplings should be wire brushed and the female coupling lubricated with graphite before the hose is stored in the racks. All damaged couplings should be repaired or replaced.

6.2.3 Ladder Inspections

The Fire Department is responsible for inspecting all ladders carried on fire apparatus. In addition, all fixed and portable ladders in the stations must be inspected on a regular basis. These inspections are made to ensure that all ladders are in a safe and serviceable condition. In addition, inspections should ensure that all joints are tight, all hardware is securely attached, and all moveable parts operate freely, without binding or play.

Anyone using a ladder is responsible for making a visual inspection before each use. Defects discovered must be brought to the attention of an officer immediately, and the ladder should be tagged out of service.

Ladder inspection assignments are specified by Fire Department procedure. Inspection periods are also spelled out in procedures. Each Fire Department member should visually inspect the ladders on his assigned apparatus during the morning equipment check. Aerial ladders must be inspected for hydraulic leaks and for obvious external structural damage.

Test all ladders to NFPA standards on an annual basis. A third party will be used to test aerial ladders. Ground ladders will be tested by the Fire Department officers who have been trained and certified in the testing

procedures.

When inspecting ladders, the inspection form must be filled out. These forms are kept in a three-ring binder in the captain's office, with a separate form for each ladder. After a ladder is inspected, the sticker on the beam of the ladder should be initialed and dated. If this sticker is missing, one should be attached.

6.3 PERSONNEL PROTECTIVE EQUIPMENT

Personnel protective equipment must comply with the applicable NFPA standards, e.g., NFPA 1971, 1972, 1973, 1974, 1975, and 1500. The equipment must also be inspected regularly to confirm its condition for use. Provided below is an example of a procedure and inspection form for accomplishing this task. {Reference DOE 5480.7A, Sections 9, 9.a.(1)(c) and 9.b.(7)}

6.3.1 Protective Clothing Inspections

Protective clothing must be inspected monthly to ensure that it is in serviceable condition and to identify protective clothing or equipment items requiring repair or replacement. This monthly inspection must be documented to meet NFPA standards.

Inspection of protective equipment should be conducted jointly by the responsible firefighter and station officer. The inspection is to be conducted on the first duty day of each month.

Helmets--including all components, shells, suspensions, head bands, sweat bands, and any accessories--should be inspected for signs of dents, cracks, penetration, or any damage due to impact, rough treatment, or wear that might reduce the degree of protection originally provided. Any helmet that requires repair or replacement of any damaged or worn part should be removed from service until the condition of wear or damage has been corrected. The label containing the manufacturer's name, address, country of manufacture, size, and fibre content must be intact. All fasteners must be intact and not broken or damaged.

All seams on protective clothing must be intact. Torn or worn seams reduce the protection of the garment. Rips or tears, if small in size, may be repaired; if large, the garment should be replaced. Certain types of soiling, such as soot and oils, greatly reduce the protection of the garment. Follow the manufacturer's instructions on the label for cleaning. Should cleaning fail to remove soils, such as soot or oil, the garment should be replaced. Garments must be complete, including shells, moisture barriers, and liners (winter and summer).

Gloves must be in good condition, with no tears or ripped seams, and not saturated with oils or other substances.

Protective footwear must have a label in place stating the name of the manufacturer, country of manufacture, size, width, model or stock number, and

lot or serial number. Check to be certain no holes, punctures, or tears have occurred, seams are intact, no leaks exist, and that the sole traction treads are not worn down. (Bunker boots should be removed from the bunker trousers for this visual inspection.) The inside of the boots should be checked visually and by hand (feel) to ensure the liner is complete and intact. Hoods must also be inspected.

Prompt replacement of damaged items must be requested using the procedure listed above. Inspection forms (Figure 6-1) must be retained by the shift officer in the employee's field file for 1 year.

6.4 TRAINING

The training program for firefighters and emergency personnel must be consistent with the applicable NFPA standards and be tailored to meet the specific requirements unique to the site hazards. Training records should be maintained in accordance with NFPA 1401. The following training program serves as an example to satisfy the training requirements. {Reference DOE 5480.7A, Sections 9, 9.a.(1)(c) and 9.b.(7)}

This publication shall provide basic minimum standards for all firefighters who provide fire protection and rescue services for DOE facilities. The qualification program is based on NFPA 1001.

The Illinois Office of the State Fire Marshall Standards and Education Division has had a program similar to this in place for over 10 years. The majority of the material in Appendix B is based on the Illinois program.

With the decade of the nineties has come an acute awareness of HAZMAT. The firefighter is often the first emergency responder on the scene of a HAZMAT incident. Because of this, the 40-hour HAZMAT First Responder training (Appendix C) is the second part of the DOE Firefighter Certification.

Since all DOE facilities have site specific hazards and restrictions, it is recommended that at least 40 hours of structured site specific training be provided as part of the DOE Basic Firefighter Program.

This means that the DOE Basic Firefighter Certification consists of three separate and distinct parts:

- NFPA Firefighter II Certification
- HAZMAT First Responder Certification
- Structured Site Special training.

This publication is the first edition of the Basic Firefighter Certification Program. As firefighting technology and techniques improve, the material shall be revised. This dynamic document is for all of us. If you note any problems, additions, updates, or corrections that should be made; please submit them as soon as practicable to DOE _____ Attention _____. Updates and replacement pages for this publication shall be sent to all DOE Facilities in a timely manner.

Figure 6-1

Protective Clothing Monthly Inspection Form

DATE OF INSPECTION_____
EMPLOYEE NAME_____

1. **HELMET**

Visually inspect for complete assembly including shell, liner, face shield, chin strap, head band, etc. Check to see that helmet is free of damage--dents, cracks, penetrations, etc.

	Yes	No
Assembly complete		
Free of damage		
Maintenance/replacement required		

2. **BUNKER COAT AND PANTS**

Visually inspect for complete assembly, shell, liner, suspenders, etc. Check garment for tears, rips, torn stitching, soiled - especially oils or soot, all fasteners present and intact.

	Yes	No
Assembly complete		
Free of damage		
Soiled		
Maintenance/replacement required		

3. **GLOVES**

Visually inspect for damage, tears, ripped seams, liner in place, not soaked with oil or soot, etc.

	Yes	No
Free of damage		
Soiled		
Maintenance/replacement required		

4. **BOOTS**

Visually inspect to see there are no holes, tears, separation, etc.

	Yes	No
Inside of liner		
Tears, holes, leaks		
Replacement/repair required		

ACTION REQUIRED:

_____ _____

Employee Signature Officer's Signature

7.0 REFERENCES

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NFPA 10, "Portable Fire Extinguisher"
NFPA 11, "Low Expansion Foam and Combined Agent Systems"
NFPA 11A, "Medium - and High Expansion Foam Systems"
NFPA 12, "Carbon Dioxide Extinguishing Systems"

NFPA 12A, "Halon T30T Fire Extinguishing Systems"
NFPA 12B, "Halon 1211 Fire Extinguishing Systems"
NFPA 13, "Installation of Sprinkler Systems"
NFPA 13A, "Inspection, Testing and Maintenance of Sprinkler Systems"
NFPA 14, "Standard for the Installation of Standpipe and Hose Systems"
NFPA 15, "Water Spray Fixed Systems"
NFPA 16, "Installation of Deluge Foam-Water Sprinkler Systems and Foam-Water Spray Systems"
NFPA 17, "Dry Chemical Extinguishing Systems"
NFPA 17A, "Wet Chemical Extinguishing Systems"
NFPA 20, "Installation of Centrifugal Pumps"
NFPA 22, "Water Tanks for Private Fire Protection"
NFPA 24, "Installation of Private Fire Service Mains and Their Appurtenances
NFPA 25, "Water Based Fire Protection Systems"
NFPA 30, "Flammable and Combustible Liquids Code"
NFPA 33, "Spray Application Using Flammable and Combustible Materials"
NFPA 43A, "Storage of Liquid and Solid Oxidizers"
NFPA 43B, "Storage of Organic Peroxide Formulations"
NFPA 43C, "Storage of Gaseous Oxidizing Materials"
NFPA 45, "Fire Protection for Laboratories Using Chemicals"
NFPA 50, "Bulk Oxygen Systems at Consumer Sites"
NFPA 50A, "Gaseous Hydrogen Systems at Consumer Sites"
NFPA 50B, "Liquefied Hydrogen Systems at Consumer Sites"
NFPA 51, "Design and Installation of Oxygen-Fuel Gas Systems for Welding Cutting and Allied Processes"
NFPA 51A, "Acetylene Cylinder Charging Plants"
NFPA 51B, "Cutting and Welding Processes"
NFPA 52, "Compressed Natural Gas Vehicular Fuel Systems"
NFPA 54, "National Fuel Gas Code"
NFPA 58, "Storage and Handling of Liquefied Petroleum Gases"
NFPA 59, "Storage and Handling of Liquefied Petroleum Gases at Utility Gas Plants"
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NFPA 68, "Explosion Venting"
NFPA 69, "Explosion Prevention Systems"
NFPA 70, "National Electrical Code"
NFPA 71, "Installation, Maintenance, and Use of Signalling Systems for Central Station Service"
NFPA 72, "Installation, Maintenance, and Use of Protective Signaling Systems"
NFPA 72E, "Automatic Fire Detectors"
NFPA 72H, "Testing Procedures for Local, Auxiliary, Remote Station and Proprietary Protective Signaling Systems"
NFPA 75, "Standard for the Protection of Electronic Computer/Data Processing Equipment"
NFPA 77, "Static Electricity"
NFPA 80, "Fire Doors and Windows"
NFPA 90A, "Installation of Air Conditioning and Ventilating Systems"
NFPA 90B, "Installation of Warm Air Heating and Air Conditioning Systems"
NFPA 91, "Installation of Blower and Exhaust Systems for Dust, Stock, and Vapor Removal or Conveying"
NFPA 96, "Installation of Equipment for the Removal of Smoke and

Grease-Laden Vapors from Commercial Cooking Equipment"
NFPA 101, "Safety to Life from Fire in Buildings and Structures" (Life Safety Code)
NFPA 110, "Emergency and Standby Power Systems"
NFPA 110A, "Stored Electrical Energy Emergency and Standby Power Systems"
NFPA 220, "Types of Building Construction"
NFPA 231, "General Storage"
NFPA 231C, "Rack Storage of Materials"
NFPA 232, "Protection of Records"
NFPA 232AM, "Archives and Record Centers"
NFPA 241, "Construction, Alteration, and Demolition Operations"
NFPA 303, "Marinas and Boat Yards"
NFPA 306, "Control of Gas Hazards on Vessels"
NFPA 307, "Marine Terminals, Piers and Wharves"
NFPA 318, "Clean Rooms"
NFPA 325M, "Fire Hazard Properties of Flammable liquids, Gases, and Volatile Solids"
NFPA 327, "Cleaning or Safeguarding Small Tanks and Containers"
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